

**Options for Radical Reforms to Pension Systems: Chilean and Swedish  
Models Compared**

**Gustavo Ferro**

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CEER  
Centro de Estudios Económicos de la Regulación  
Universidad Argentina de la Empresa  
Lima 717  
C1053AAO Buenos Aires, Argentina  
Telephone / Fax: 54-11-43797693  
E-mail: [ceer@uade.edu.ar](mailto:ceer@uade.edu.ar)  
<http://www.uade.edu.ar>

# Options for Radical Reforms to Pension Systems: Chilean and Swedish Models Compared

Gustavo Ferro<sup>1</sup>

## Abstract

Pension systems are under stress in the whole world. Demographic tendencies, informal labour markets, and distributive designs –inter alia-, coupled with the rigidity of the legislation, and implied financial imbalances, social debate and –sometimes-, reforms. These could be classified into two main categories: parametric and radical reforms.

Two models have features to be classified as radical pension reforms in the last decades: Chilean (or AFP) and Swedish (or NDC) models.

The central aim of this essay is to compare both radical reforms, at the level of “ideal types”. Doing that, some questions are answered, namely: In what feature do they have differences? Which are the incentives they set to human behaviour in order to meet the goals of the design? Are the models truly different? Which problems do they address and which to they set aside? Moreover, which problems remain unsolved, and what troubles do they add?

Here, the intention is to concentrate in the technical aspects of the design intended to solve financial problems of the systems, trying to show the relevant trade offs.

## I Introduction

Pension systems are under stress in the whole world. Demographic tendencies, informal labour markets, and distributive designs –inter alia-, coupled with the rigidity of the legislation, and implied financial imbalances, social debate and –sometimes-, reforms. These could be classified into two main categories: parametric and radical reforms. That taxonomy is a little arbitrary: radical changes are in fact a matter of degree: they comprise great parametric changes, but the aesthetics of the reform is peculiar: they take the form of paradigm shifts instead of comparative static-type reforms. Parametric reforms, such as adjustment in pension ages, or to contribution rates, would be considered sufficient to restore its financial equilibrium, and some sense of fairness. A radical reform has the potential of create a new set of parameters and a new rhetoric (Borsch-Suppan, 2003). Parameters could be reshaped once and for all.

Two models have features to be classified as radical pension reforms in the last decades: Chilean (or AFP<sup>2</sup>) and Swedish (or NDC<sup>3</sup>) models. The former has been replicated in some

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<sup>1</sup> Universidad Argentina de la Empresa (UADE), Buenos Aires, Argentina. [gferro@uade.edu.ar](mailto:gferro@uade.edu.ar)

developing countries and the latter has appeal to some Eastern Europe countries, and even developed European nations like Italy or Germany.

The central aim of this essay is to compare both radical reforms, at the level of “ideal types”. Doing that, some questions are answered, namely: In what feature do they have differences? Which are the incentives they set to human behaviour in order to meet the goals of the design? Are the models truly different? Which problems do they address and which to they set aside? Moreover, which problems remain unsolved, and what troubles do they add?

The contexts of the reforms are absolutely different, and the debate is elsewhere plagued by ideological and political arguments. Here, the intention is avoid that part of the debate, to concentrate in the technical aspects of the design intended to solve financial problems of the systems, trying to show the relevant trade offs. There is also a philosophical debate in the air, around of the very concept of social security. This article remains outside of that discussion.

In section II the meaning of parametric and radical in the context of pension reforms is discussed, section III is devoted to Chilean reform and section IV to Swedish model. Section V includes the comparison and some conclusions are drawn.

## II Parametric and Radical Reforms

A Pension Scheme is a part of Social Security Institutions, with the specific aims of providing consumption to the elder, and related financial support to disabled and survivorship. Social security supports the population in the event of biological loss of some ability to earn money. The system could comprise redistribution features (explicit or implicit), insurance and saving functions, with different weights.

Let  $N_p$  = pensioners,  $P$  = Average pension,  $N_w$  = contributors,  $W$  = Average wage subject to contribution,  $t$  = contribution rate. A balanced pension system has to match contributions to paid pensions. The matching formula (supposing one period for simplicity) is:

$$1) \quad N_p P = t N_w W$$

Hence,

$$2) \quad t = (N_p/N_w) (P/W)$$

$$3) \quad t = D \cdot R$$

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<sup>2</sup> The acronym in Spanish for Pension Fund Management Companies (PFMC).

<sup>3</sup> The acronym for Notional Defined Contribution. Notional in this context is a synonym of virtual.

Where  $(Np/Nw) = D$ , and  $(P/W) = R$ . The contribution rate that balances the system is equal to the product of the « dependence ratio » ( $D$ ) times the « replacement ratio » ( $R$ ). The dependence ratio shows how many pensioners have to be supported by each contributor.

$Np$  is sensitive to changes to the legal age to enter in the job market to retirement age, and to the life expectation. *Ceteris paribus*,  $Np$  increases along with extension in the life expectation, and decreases with later retirement age.

$Nw$  is sensitive in the contrary sense to changes in legal ages, positively related to the increase of female participation in labour markets, and negatively related to informality in the labour markets. This, in turn, depends on the degree of distortions on labour markets (positively), and in general on incentives to labour taxes evasion or elusion. If  $t$  is very high, the same consideration applies. From an agency theory perspective, it could be expected that evasion and elusion decrease with the ability of the benefit formula to link own contributions to own benefits.

In a broad sense, “dependence ratio” is decreasing in the whole world because of demographic tendencies, and in developing countries because of the addition to that fact of informality. In developed countries informality is less frequent, but the pressures that a high level of  $t$  puts on formal labour markets are there important.

“Replacement ratio” could be endogenous, like in “defined contribution” systems, or exogenous in “defined benefits” schemes. In the former, the legislation does not impose the equality between a percentage of earnings to the pension value, allowing more flexibility to a system which is subject to demographic pressures. If *ceteris paribus* expectancy of life increases, the system could face that by reducing the endogenous “replacement ratio”. In a “defined benefit” world, the results are different, because the ratio is exogenously set by the legislation. The system could then run a superavit (and accumulate reserves), in an early stage, or deficits (and accumulate debts) later. An indebted system put pressures to public finance, and to policy makers to increase retirement age, to augment contribution rate or to lower legal replacement ratio.

If a pension system *has* to be organized, there are some decisions to make, and the system could be:

- 1) Mandatory or voluntary.
- 2) Public or private provisioned.
- 3) Defined benefits or defined contribution.

- 4) Pay-as-you-go, based on intergenerational transfers or fully funded, based on personal savings.

A lot of possibilities arise. Every combination has pros and cons, and in the real world, a subset of those combinations has empirical relevance. For example, in developed countries could be found public/pay-as-you-go/defined benefits/mandatory schemes, in coexistence with a variety of private/fully funded/defined contributions or defined benefits/voluntary plans. The more pristine examples of the above combination are the United States and the United Kingdom.

The systems diverge *among* developed countries in the relative importance of the private “pillar”, the degree of public involvement, the detail of state regulation, and the level of admissible redistribution. Some countries, starting from a public/pay-as-you-go/defined benefits/mandatory schemes had tended to develop some kind of multi-pillar arrangement. Structural changes since the 1970s forced the introduction of some flexibility in the schemes, adding some kind of early retirement provisions, as a skill-obsolescence insurance against technological shocks on human capital.

Social security benefits usually are intended to fulfil distributive goals. Therefore, real world schemes, most of the time, are composed by a lump sum and an active life earnings related part. The relative importance of every part depends on specific legal design, as provisions of early retirement. Subsidies or penalties tend to distort labour effort.

Because of the importance of inflation on fixed incomes, some countries had introduced some form of indexation, both to accrued contributions and to current benefits.

Latin American pension systems, have their own problems, along with the universal tendencies to worse “dependence ratios” because of an adverse demography, focused on the informal economy, high inflation periods and political abuse in the form of special benefits to certain influential groups of the population.

Legislation setting commitment to defined benefits, and freezing contributions and demographic parameters (in particular, age of retirement) were thought (and enacted) for a more static world. Promises, in presence of shocks to those exogenous parameters, turned more difficult to accomplish, and projections pointed out an apocalyptic future, with growing deficits. In terms of equation 3), the balanced relationship is broken.

Between the multiple alternatives to cope with the former, two broad groups could be found: parametric reforms and radical reforms.

Parametric reforms include isolated or combined elements of the following:

- 1) Lump sum benefits instead of earnings related benefits (lower R)

- 2) Increased retirement age (lower  $D$ ).
- 3) Decreased nominal benefits (lower  $R$ ).
- 4) Subindexation of nominal benefits (lower  $R$ ).
- 5) Increased contributions (higher  $t$ ).
- 6) Elimination of special treatment to some groups (lower  $D$ ).

All parametric reforms to pension organization are technically feasible measures to solve the problems, but politically conflicting issues. Along with solutions in partial equilibrium to the pension system, they cause “collateral damage” on efficiency (in the functioning of labour markets, for instance) and are not neutral on income distribution. It is not strange that the debate has been hot, and contaminated by ideological arguments.

With respect to point 6), if cross subsidies have a reasonable degree of social consensus, and a sustainable technical design, they will not put some stress on the system. But if every pressure group holds a particular (more favourable) treatment, the system financial stability is eroded.

Radical reforms, to be fair, are defined in relative terms. Here, the criteria is call them so, when they include a relatively aggressive combination of various parametric changes. Chilean (or AFP) and Swedish (or NDC) models fell into this category.

Chileans invented a model of organization in 1980. It is a new paradigm and it was adopted (and adapted) with more or less changes in an important group of Latin American and Transition Economies, with similar problems (deficient pay-as-you-go systems, high inflation and/or macroeconomic instability). The main features are: mandatory participation, individual accounts (breaking with a more or less arbitrary cross subsidies tradition), defined contributions, some state guarantees (including a heavy public regulation and a minimum universal benefit), and private management of the funds by means of specially designed intermediaries. In the weighted sum of redistribution, insurance and saving function of any pension system, the older Chilean scheme was heavily concentrated in the first and the second aims, and the newest rests on a more relevant role for the second and the third goals. Contributions to the old system were credited in the individual accounts by means of a Recognition Bond.

The marketing of the scheme included a heavy weight on individual property of the contributions, and on expected by-products for the economy as a whole, in terms of better savings rate and increased rates of economic growth. Effects on savings due to the reform are difficult to measure in practice (See Acuña and Iglesias, 2001), but after the reform (and may be, in part due to) Chile has enjoyed an enviable economic growth performance. The reform was followed by an

important development on financial instruments and markets, and the system has accumulated a very important level of assets. For the purposes of this paper, the discussion on the effects on savings and growth will be set aside, to concentrate in social security aspects. Just the accumulation of financial resources will be mentioned as a by-product of the reform, in order to draw some comparisons with the other considered radical reform.

More recently, in Sweden another model was designed, and it seems appealing to Eastern Europe, and other countries with the same demographic problems than Sweden. The system is a combination of a (little) fully funded, with a new pay-as-you-go/mandatory/defined contributions/public scheme. It has a high degree of flexibility of the retirement age (departing from a minimum), preserves a minimum universal pension with distributive purposes, but, like Chilean model, contributions are sent to a personal account (notional or virtual, in this case). Because of the relatively high labour taxes in Sweden, and in the recognition that those figures are distort, the new system is designed to maintain the contribution rate invariable, without causing financial stress. In the weighted sum of redistribution, insurance and saving of any pension system, the older Swedish system was heavily concentrated in the first and the second aims, and the new rests on a more relevant role for the second goal, including a little room for the third –in fact covered by private plans-. Contributions to the old system, as in Chile, were credited in the individual accounts.

### **III Chilean Model**

Chilean reform was followed by Peruvian in 1992, Colombian and Argentine in 1993, Uruguayan in 1995, Mexican, Bolivian and Salvadorian in 1996, Nicaraguan in 2000, Ecuadorian in 2001, and Dominican in 2003. Apart from Latin American countries, Croatia, Hungary, Kazakhstan, Latvia and Poland had incorporated elements based on that seminal reform.

The Chilean model mandates participation to all active workers. Special intermediaries monopolize the management of the savings: Pension Funds Management Companies (PFMC, or AFP in Spanish). The PFMC are heavily regulated. They could only buy financial assets on a restrictive list, and the composition of the portfolio is subject to a number of constraints, to avoid concentration of property and conflicts of interest in general (Demaestri and Ferro, 2004). Corporate governance exerted by PFMC is passive in the management of the private companies where the funds have interests. The portfolio is property of the contributors, not of the PFMC: its assets are insulated from that of their affiliates. Since 1993, all new entrants to labour force have

to affiliate to one PFMC on a mandatory basis. There is no obligation of contribution to independent workers: its participation is voluntary.

The ratio contributors/affiliates in PFMC sector, dropped from 73% in 1982 to 50% in the year 2000. The more recent figure, in 2004 was 3.6 million contributors on a regular basis, over 7 million affiliates (see [www.safp.cl](http://www.safp.cl)). But this figure worsens because of excluding persons who leave labour force or do not contribute due to unemployment episodes. Self-employed had chosen in a very low proportion to remain contributing to the system.

The system is fully funded, based on savings on individual accounts. Distributive functions were isolated, and concentrated in the official guarantee of a minimum flat benefit to all the participants. The guarantee acts as a supplementary payment to the personal savings, allowing buying a certain minimum annuity. The system is defined contribution, beyond the minimum benefit. Contributions to the precedent pay-as-you-go, public and fragmented system were recognized by means of a Recognition Bond credited to every worker in their personal accounts, which are tradable in financial markets.

The operation of the system, which credits 10% of personal taxable earnings every month, has accumulated an important mass of financial resources<sup>4</sup>. Starting almost exclusively with a portfolio concentrated in public indexed debt, now they include private stocks and bonds, and PFMC's portfolios gave impulse to a very important mortgage market. The part of the portfolio which could be integrated by foreign financial assets grew to a roughly 20% of the total assets.

Before the reform, a pay-as-you-go, mature system existed from 1920 to 1980. Their more relevant features were deficits, privileged treatment to some pressure groups, deficient management, and a discretionary indexation in a very high inflation environment (Lüders, 1991). As Acuña and Iglesias (2001) describe, "The history of Chilean social security has been described as an uninterrupted sequence of schemes specially created for groups with political power and of resources collected by pension programmes being used to finance other types of benefits".

The dependence ratio went from 0.09 in 1960 to 0.45 in 1980, that means that eleven workers financed every benefit in 1960, and a little more than 2 did that in 1980. The reform encompasses all precedent system except Armed and Security Forces, where between the reasons invoked for not including them, the management of sensitive information by private companies were mentioned (Acuña and Iglesias, 2001). Around benefits to the Armed Forces, in 1997

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<sup>4</sup> Near of 50 billion dollars in assets were accumulated, a half Chilean GDP.



around 93% of the pension expenses to military personnel came from the general revenues of the state, and a 95% of the resources devoted to the same end for security forces originated in general taxes.

The ages of retirement were increased in five years, both for male and female contributors, and they were unified in 60 for women and 65 for men. The benefits paid include: old age pension, early retirement old age pension, invalidity pension (the system provide them with a collective mandatory insurance policy for invalidity and death), survivorship pension, and the state guarantee for minimum pension. More requirements on anticipated pension (which is popular) had been introduced after the reform, putting the floor of 150% of minimum pension instead of 110%, as the amount of resources in the individual account to allow the former.

The system was chosen specially by younger workers, which could accumulate more money in their individual accounts in the rest of their labour life. Old age pension is financed by the 10% contribution, and for the insurance and PFMC fee, there is an additional charge, whose average is another 3%. The state guarantee is provided from general taxes. The old system continues to pay benefits to pensioners in the precedent arrangement, and it will disappeared in the future when the last old pensioner and their survivorship with rights die. At the time of the reform, in eight month two thirds of eligible workers opted for the new system, and to the final of 1983, 77% had made such decision. There were economic and other incentives to do that. An increase in net wages, heavy official advertisement and the Recognition Bond on rights to the old system were part of those incentives.

The system allows voluntary savings to be integrated to the portfolio. Non-contributory benefits are paid from the general state budget to the poorer elder.

The empirical evidence showed responses to commercial effort and marketing in the behaviour of affiliates. They have free to choose between PFMC, but the evidence do not shows an economic choice based on funds performance and fees. The heavy regulation on structure and performance in the PFMC industry standardize portfolios composition and performance. Marketing expenses are devoted to differentiate almost equal products (Mastrángelo, 1999). Recently, a reform allows the existence of five different composed portfolios by each PFMC, which difference each other by its content of stocks.

An important part of active population remains uncovered. Into covered workers, some do not contribute on a regular basis, and independent workers, which participation is voluntary, had almost disappeared from the system.

Some particular characteristics of the system to be highlighted are:

- 1) It accumulates funds, disposable to finance the whole economy.
- 2) Demographic shocks are absorbed indirectly, by the growing cost of annuities along with the increase in life expectancy. The ways to finance the benefit are buying an annuity in retirement insurance companies or some kind of programmed retirement of the savings in agreement with the PFMC. The majority of current retirees had chosen annuities.
- 3) The industry is heavily regulated, but some key decisions remain in hands of the private sector.
- 4) The rate of return of the funds depends on the market value of the financial assets in the portfolios. Regulation tries to reduce the variance along the average performance, but the system is sensitive to a financial crack. A financial crisis in the early eighties did not affect the system, at the time concentrated in public debt. In the nineties, external financial crisis influenced negatively the returns of the funds, but in general, for Chile the period of the reform was economically successful, with high economic growth rates.

#### **IV Swedish Model**

Swedish model is one of mandatory participation, pay-as-you-go mainly, but with individual records of contributions, and redistribution and savings functions of the pension system are set aside. The scheme is defined contribution, against the practice of defined benefits pay-as-you-go systems. New NDC system has similarities with those of Latvia, Poland, Italy and Germany (Scherman, 1999). In Sweden, invalidity and survivorship benefits are set aside of elder pensions.

The debate on Swedish reform, started in the 1980s, and deepened in the 1990s. Bad economic results in the latter induced to the action. The former system comprised a minimum benefit plus an earnings-related scheme. Minimum benefit was a flat pension, with supplements, financed by employers and general revenues. Earnings related part was a pay-as-you-go scheme, replacing income up to a certain ceiling. It was financed mainly by employers, and increasingly, by employees' contributions. Pensions were indexed by price inflation, with independence of the state of the economy.

Minimum flat benefit was for persons who had lived in Sweden for at least 40 years, or worked for at least 30 years. An indexed value was the basis for the benefit. The basis was almost equal to 20% of average full time workers' income. Single pensioners received 96% of the basis, and in couples, every spouse 78.5% of the basis. Earnings related pension, were a roughly 60% of

the indexed average income for full time workers, in the best 15 years of the career, with a ceiling of 7.5 the basis.

Old system suffer three main problems:

- 1) Imbalances between revenues (indexed to wages) and expenses (indexed to prices). In a context of poor performance of real wages, pensions do not reflect the state of the labour market, and the system goes into deficit.
- 2) The taxable salary ceiling was indexed to prices. So, too much people were converging to minimum pension.
- 3) Adverse demography. Around the year 2000, there were 30 pensioners by old age, over 100 active people. That figure was projected to be 41 over 100 in 2025.

Other problems aggravated the former, as the increased unemployment rate, and a weak link between contributions and benefits.

In Sweden there are occupational schemes, based on collective agreements and individual voluntary pension schemes, in addition to public social security. In the first case, almost all Swedish employees own that, without state's mandate, but the contributions are mandatory if the plans are agreed by collective agreement. Four private insurance plans concentrated 90% of contributors. Private system allows filling the gap imposed by the ceiling to high salaries in the social security.

As in Chile, rights on the old regime were credited, in this case as an accountancy registration. The new system has three parts: a contributory segment, pay-as-you-go, in notional accounts, not including survivorship pensions. It demands 16% of contribution from taxable salaries. Another contribution of 2.5% on taxable salaries is capitalized in funds invested predominantly in public debt. A guarantee of minimum benefit completes the scheme, acting as a supplement to reach that minimum amount in the same way as in Chilean minimum pension. In this case, the pretended replacement ratio is around one third of average taxable salary. It addresses distributive aims and the funds are provide from the general budget.

The new arrangement comprises:

- 1) Minimum pension, offered as a supplement by the state to that persons who do not have the right to a earning related pension, or if this falls below the minimum. Its resources come from general taxes. The minimum benefit is equal to the difference between a guaranteed level, and the earnings related level corresponding to that person. Maximum supplement was 2.13 times the calculation basis (in 1998, around US\$ 10,000 per year). This basis is indexed to prices.

2) Earnings related scheme, encompassing a pay-as-you-go plus a premium fully funded scheme. It is financed with 18.5% contribution on taxable wages. From the contribution, 16% over 18.5% goes to pay-as-you-go notional account, and 2.5% to the fully funded scheme. From the premium reserve pensions, benefits can be drawn only as life annuities, provided by the Premium Pension Authority. Contributions were split, 50% on the employer, and 50% on the employee. The state will finance guaranteed rights over transitory invalidity or disease periods, unemployment, child care, military service and superior education.

3) Voluntary savings in private insurers, in existent occupational schemes.

Contribution rate is expected to be constant at current levels. Adjustments will rest on the age of retirement and/or the value of the annuity. Benefits are based on all labour life, subject to an annual ceiling. Rights are indexed to average salaries, and accumulated for the whole labour life. Retirement age is 61 (minimum) or more, on behalf of the individual. The benefit will depend on average life expectation of the cohort, and on the individual retirement age. Benefits are indexed with wage growth, minus an annual rate of 1.6%.

The basic constraint in the reform was the designing of a pay-as-you-go defined benefit system, financially stable in the face of fluctuations in demographic and economic growth. Contribution rate was thought to be a constant. As Scherman (1999) states, “the key objective for establishing the annuity factor and designing the indexation rules is that pension payments shall be linked to the system’s ability to meet its obligations at a stable contribution rate”. Life expectancy is the key element in the determination of the annuity factor and the pensions are linked to the development of average wages. Raising contributions cannot solve financial problems, since extra contributions would constitute additional pension rights. At the time of the reform, the precedent system had five and a half years of current pensions in the form of accumulated reserves.

The annuity factor is calculated as follows (on a monthly basis):

$$4) An = \sum_k \sum_x P(k, x) F(n, k, x)/12$$

Where  $An$  is the annuity factor for a person who retires at the age  $n$  years,  $x = 0$  months.

$P(k, x)^5$  is the likelihood for a person, who has reached age  $n$ , to be alive at age  $k$  years and  $x$  months.

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<sup>5</sup>  $P(k, x) = \{Lx + (Lk+1 - Lk) * x/12\}/Ln$ , where  $Li$  is the number of surviving people at age  $i$ .

$F(n, k, x)^6$  is the discount factor from the age  $k$  years and  $x$  month, to the age  $n$  years. The normal pension age is “indexed” in accordance with life expectancy.

The sums go over  $x$  from 0 to 11, and over  $k$  from  $n$  to infinite.

It is not until 2018 that expenditure under the new rules will account for more than half of the new total payments for earning related pensions (Scherman, 1999).

Notional accounts records are indexed to the average wage in the economy. To determine the annuity, at the age of retirement, which is free after 61 years, the notional account is divided into the life expectancy of the cohort. So incentives to early retirement are clear, and the cost of demographic shocks are explicit. Survivorship benefits are insured outside the NDC system.

The system does not accumulate resources, with the exception of the fully funded part. It applies the structure and rhetoric of Chilean shape private fully funded schemes, to a pay-as-you-go arrangement with more flexibility to demographic changes. The authorities determine the interest rate applied to reserves.

## V Comparison and some conclusions

Some questions were presented in the introduction: In what feature do they have differences? Which are the incentives they set to human behaviour in order to meet the goals of the design? Are the models truly different? Which problems do they address and which to they set aside? Moreover, which problems remain unsolved, and what troubles do they add? Here is the place to try to answer them.

In what feature do they have differences? May be the better answer is starting with the similarities:

- 1) Implicit debt of an old shape pay-as-you-go system is made explicit, and past contributions are recognized in advance.
- 2) Distributive aims are separated from insurance and savings goals of the pension system.
- 3) There are important gains in transparency

In both systems, all contributors get some form of the capitalized value of their contributions. In one case, the indexation is to nominal average wage growth rate, in the other, the rate of return on financial assets in the portfolio.

NDC system does not accumulate reserves (or if does that, at a little extent), so the system is not sensitive to a private embezzlement or to a public confiscation. Chilean scheme

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<sup>6</sup>  $F(n, k, x) = 1.016^{\{(n-k) - x/12\}}$

accumulated important reserves. That was not the case in Chile, but recently, in Argentina, who replicated fully funded Chilean shape system, portfolios mainly in public debt were affected by compulsive restructuring of public debt, implying one third haircut on that bonds holdings.

NDC systems require strong administrative capabilities and long time contribution recording (See Brooks and Weaver, 2003). Not all countries enjoyed that quality of means. Chilean shaped systems, in the other hand, showed a heavy load on commercial expenses not clearly associated to better replacement ratio to contributors. Technology provides ways to deal with an expensive way to preserve competition between private providers (See Ferro, 2003).

Which are the incentives they set to human behaviour in order to meet the goals of the design? Both systems contain sense of actuarial fairness, because of the closed links between contributions and benefits. That horizontal equity is expected to generate incentives to individual participation. Contribution evasion or elusion is punished in the form of little benefits. It can be said that the system contains scarce “solidarity”, since the emphasis is set on individual contributions. All distributive functions are explicit in the minimum benefit subsidy. More interestingly, since their financial resources came from general taxes, those do not distort labour markets. In Chile, another redistribution came from the different age for retirement: women retire earlier and their life expectancy is greater, and there are some debate related with the way the Recognition Bond was calculated (See Acuña and Iglesias, 2001 and Ruiz Tagle, 2001).

Swedish system allows to automatic adjustment of the age of retirement. A floor age of 61 is set. In the Chilean system, there is no possibility to late retirement, but earlier retirement is possible, and in fact, an important proportion of people choose that option (Ruiz Tagle, 2001).

Benefits in both systems are based on the whole labour record of the worker, and not on a whimsical selection (for example, later 5 or 10 years, or the better 15 of the workers’ career).

Notional interest rate in Sweden introduces a discretionary element capable of distort the balance between contributions and benefits, for the part of notional capital recognized to old system contributors. Chilean Authorities set an arbitrary real rate of 4% per year top the Recognition Bond credited in the individual accounts.

The Swedish criteria of indexing notional accounts with average wage growth rate introduce some business-cycle risk on workers virtual savings. In Chile that risk is present in other form, since the financial assets are expected to reflect the state of the real economy.

Are the models truly different?

The models continue to be different, as pay-as-you-go is in fact different from fully funded. Similarities arise in the defined contribution feature of both regimes, its mechanisms of

rights' recognition, its isolation of distributive functions, and microeconomic incentives setting, in the form of private property on contributions.

Which problems do they address and which to they set aside? Moreover, which problems remain unsolved, and what troubles do they add?

They address classic problems of rigidity in legislation: Swedish system, for instance, solves the problem of a fixed retirement age, both schemes prevented excessive (or arbitrary) redistribution of common pool resources, Swedish and Chilean systems had establish ceilings to contribution rate, and with that, to distortions on labour markets. But some new problems arise. In the Chilean model a new set of regulations have to be enacted, and some costs of the industry of PFMC appeared, as commercial expenses. Other question is the regulation of the portfolios, which seems very detailed and rigid. Detailed regulation could be in the future gradually adjusted to prudent man criteria present in developed countries with a tradition on private property respect (See Demaestri and Ferro, 2004).

Chilean model has the potential to increase pensions with good results in financial assets, which in fact reflect the good shape of the economic activities they finance; but also introduces some volatility in pensions. Swedish model have not the benefits neither the perils of market volatility.

As a final conclusion, both schemes are argumentative and psychological resources. They allow balancing imbalanced systems, to discuss more technically around the inconsistencies of the legislation, and to show the relevant trade offs.

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